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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/767,540

01/29/2004

Mirmira Ramarao Dwarakanath

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EXAMINER

BEHM, HARRY RAYMOND

ART UNIT

PAPER NUMBER

2838

DATE MAILED: 01/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

aa.

Office Action Summary	Application No. 10/767,540	Applicant(s) DWARAKANATH ET AL.	
	Examiner Harry Behm	Art Unit 2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/29/04 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/16/05</u> 8/9/04 | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

Figure 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 6, 8, 11, 13, 16 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Sase (US 6,879,137).

With respect to Claim 1, Sase discloses a driver comprising switching circuitry (Fig. 1 DRV) referenced to a voltage level (Fig. 14 GND) and configured to provide a

drive signal for a switch (Fig. 14 Q1) referenced to another voltage level (Fig. 14 Vi) and subject to a control voltage limit (Fig. 14 gate voltage limit of Q1).

With respect to Claims 3, 8, 13 and 18 Sase discloses the driver as recited in claims 1, 6, 11 and 16 respectively, wherein said switch (Fig. 14 Q1) is a metal oxide semiconductor field effect transistor (MOSFET) (paragraph 45 "MOSFET Q1") referenced to said another voltage (Fig. 14 Vi), said switching circuitry configured to provide a gate drive signal (Fig. 14 DRVU output) for said switch within a gate voltage limit thereof (Fig. 14 gate voltage limit of Q1).

With respect to Claim 6, Sase discloses for use with a power converter couplable to a source of electrical power adapted to provide an input voltage thereto, said power converter including a power train having a switch referenced to said input voltage and subject to a control voltage limit, a driver, comprising: switching circuitry (Fig. 14 DRV) referenced to a voltage level (Fig. 14 GND) different from said input voltage (Fig. 14 Vi) and configured to provide a drive signal (Fig. 14 DRVU output) for said switch (Fig. 14 Q1) within said control voltage limit of said switch (Fig. 14 gate voltage limit of Q1).

With respect to Claim 11, Sase discloses for use with a power converter couplable to a source of electrical power adapted to provide an input voltage thereto, a method of driving a switch (Fig. 14 Q1) of said power converter referenced to said input voltage (Fig. Vi) and subject to a control voltage limit (Fig. 14 gate voltage limit of Q1), comprising: providing a drive signal (Fig. 14 DRVU output) for said switch within said control voltage limit of said switch with switching circuitry (Fig. 14 DRV) referenced from a voltage level (Fig. 14 GND) different from said input voltage.

With respect to Claim 16, Sase discloses a power converter couplable to a source of electrical power adapted to provide an input voltage thereto, comprising: a power train (Fig. 14 L, Co, Q1 and Q2) including a switch (Fig. 14 Q1), referenced to said input voltage (Fig. 14 Vi) and subject to a control voltage limit (Fig. 14 gate voltage limit of Q1), configured to conduct for a duty cycle (paragraph 11 "duty control") and provide a regulated output characteristic (Fig. 14 Vo) at an output of said power converter; a controller (Fig. 1 EA, PWM) configured to provide a signal (Fig. 14 U) to control said duty cycle of said switch; and a driver (Fig. 14 DRVU) including switching circuitry referenced to a voltage level (Fig. 14 GND) different from said input voltage and configured to provide a drive signal (Fig. 14 DRVU output) for said switch within said control voltage limit as a function of said signal from said controller.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sase in view of Brkovic (US 5,877,611).

With respect to Claims 2, 7 and 12 Sase discloses the driver as recited above, wherein said switching circuitry is referenced to a ground potential (Fig. 14 GND) and said switch is referenced to Vi. Sase does not specify a preferred voltage for Vi.

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Brkovic teaches it is common for switching regulators to have five volts coming into the switch in order to step the five volt input down to a lower value. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply five volts to Vi.

Claims 4-5, 9-10, 14-15, 17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sase in view of Goswick (US 6,407,579).

Sase discloses a power converter with a driver containing level shifting. Sase does not disclose the details of the driver to the transistor level. Goswick teaches several common level shifters with gate voltage limit protection that were available at the time. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the level shifter of Goswick to drive a power switch. The reason for doing so would be to achieve the necessary level shifting while maintaining gate voltage limit protection.

With respect to Claims 4, 9, 14 and 19 Sase in view of Goswick discloses the driver as recited above, wherein said switching circuitry (Goswick Fig. 2 20) comprises a plurality of driver switches (Goswick Fig. 2 Q4,Q12) couplable to ground (Goswick Fig. 2 Vss) and referenced to a ground potential (Goswick Fig. 2 Vss) and said switch (Sase Fig. 14 Q1) is couplable to a source of electrical power and referenced to said another voltage level (Goswick Fig. 2 Vpp) provided therefrom, ones of said plurality of driver switches (Goswick Fig. 2 Q2,Q3,Q10,Q11) being couplable to said ground (Goswick Fig. 2 Vss), said source of electrical power (Goswick Fig. 2 Vpp) and a bias voltage source for providing a bias voltage (Goswick Fig. 2 B,C), ones (Goswick Fig. 2

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Q2, Q10) of said plurality of driver switches configured to cooperate to provide said drive signal (Goswick Fig. 2 OUTPUT) referenced to said another voltage (Goswick Fig. 2 Vpp) and within said control voltage limit of said switch [Goswick guarantees the gate oxide voltage limit is met for each transistor in the circuit, and the limit will be met at the switch Q1 by proper selection of the bias voltage].

With respect to Claim 5, 10, 15 and 20 Sase in view of Goswick discloses the driver as recited above wherein said switching circuitry (Goswick Fig. 2 20) comprises at least one driver switch (Goswick Fig. 2 14) configured to enable a mode of operation (Goswick Fig. 2 2 E) wherein said drive signal (Goswick Fig. 2 OUTPUT) for said switch (Sase Fig. 14 Q1) is referenced to said voltage level (Sase Fig. 14 Vi).

With respect to Claim 17, Sase in view of Goswick discloses the power converter as recited above wherein said controller [Goswick Fig. 2 Q5 and Q6 are considered part of the controller] is configured to provide a complement (Goswick Fig. 2 node drain of Q5,Q6) of said signal (Goswick Fig. 2 A) to control said duty cycle of said switch (Sase Fig. 14 Q1), said driver being configured to provide said drive signal for said switch within said control voltage limit as a function of said complement of said signal from said controller.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jacobs (US 6,822,882) discloses a gate driver with offset bias. Tanaka (US 6,392,439) discloses additional level shifters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry Behm whose telephone number is 571-272-8929. The examiner can normally be reached on Business EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl Easthom can be reached on 571-272-1989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


KARL EASTHOM
SUPERVISORY PATENT EXAMINER